

Dr. Barry's Report to the Local Government Board upon
the General Sanitary Condition of the Sculcoates
Rural Sanitary District.

GEORGE BUCHANAN,
Medical Department,
June 23rd, 1890.

THE Sculcoates Rural Sanitary District consists of all those contributory places of the Sculcoates Union which are not contained in any urban district. In 1881 it comprised an area of 24,816 acres, and contained a population of 8,670 persons; but in April 1883 the Stoneferry portion of the township of Sutton, with an area of 525 acres, and a population of 567, together with the township of Marfleet, having an area of 1,285 acres, and a population of 183 persons, were added to the Borough of Kingston-upon-Hull, leaving in the Rural District an area of 23,006 acres, and a population of 7,920 persons. The population of this district is now estimated at 8,400.

The district consists of three detached portions lying respectively to the east, north-east, and west of Hull, and separated from each other by that borough. The portions which lie east and north-east of Hull and the portion to the west of this town are at their nearest points, distant from each other upwards of four miles. The two portions to the east and north-east are situate on the heavy boulder clays of Holderness, and comprise the low-lying parishes of Sutton (north-east) and Preston (east). The portion to the west of Hull, comprising 11 contributory places, is situated partly on the southern extremity of the Yorkshire Chalk Wolds, and partly on the low-lying lands on the north bank of the Humber.

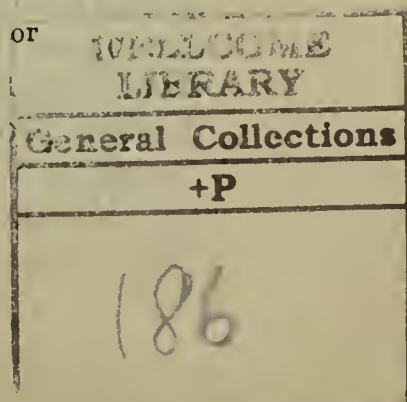
The greater part of the district is intersected by open dykes constructed for land drainage purposes, which have their outfalls into the Humber. These dykes are under the control of Drainage Commissioners, and the flow of water in them is regulated by means of sluices (locally termed "cloughs") placed at frequent intervals.

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The area, number of houses, population, and rateable value of the several contributory places in the district are shown in the following Table :—

TABLE I.

Contributory Place.	Area in Acres.	Census, 1881.		Rateable Value, 1890.	Persons per House.	Acres per Person.
		Houses.	Population.			
				£		
Anlaby - -	1,471	119	629	4,676	5·3	2·3
Haltemprice - -	209	1	6	265	6·0	34·9
Hessle - -	2,695	541	2,551	16,444	4·7	1·1
Kirk Ella - -	1,147	62	329	2,903	5·3	3·5
Melton - -	897	36	172	2,860	4·8	5·2
North Ferriby - -	1,008	99	473	4,770	4·8	2·1
Preston - -	5,012	211	881	9,998	4·2	5·7
Sutton - -	3,381*	?	1,280*	10,466	?	2·7*
Swanland - -	2,871	98	438	6,166	4·5	6·5
Wauldby - -	1,021	8	44	1,058	5·5	23·2
Welton - -	1,778	142	669	4,953	4·7	2·7
West Ella - -	534	32	136	759	4·3	3·9
Willerby - -	982	60	312	2,104	5·2	3·1
Seuloates Rural Sanitary District - }	23,006	—	7,920	67,422	—	2·9

* Estimated only.

The subsoil in Sutton and Preston on the north-east and east consists essentially of glacial boulder clay, covered by warp and other fluvial deposits, all this portion of the Holderness plain having been once sea bottom. The western townships are situated on strata of the Chalk formation, which here have a general dip towards the south and east. The Chalk is covered by an irregular mantle of clay which becomes very thick near the Humber. The inhabitants generally of the District are engaged in agriculture, especially in dairy farming, much of the milk used in Hull being drawn from this district. In the western portion there are a number of mansions of the local gentry, as well as a great many suburban residences of persons engaged in business in Hull.

In the whole Rural District the population increased between 1871 and 1881 at a rate of about 14 per cent. This rate of increase, however, was not maintained in all the parishes, the greatest proportional increase taking place in the villages of Hessle, Anlaby, Willerby, and Sutton, and the least in North Ferriby, Kirk Ella, and West Ella. The population was practically stationary in Wauldby and Welton, whilst there was an actual decrease in Melton, Swanland, and Preston.

Former Inquiries.—An inspection of the western portion of the district was made in 1877 by Dr. Blaxall, in consequence of an epidemic prevalence of diphtheria, and portions of the district were inspected in 1882 by Dr. Airy in connexion with a prevalence of scarlatina which occurred at that time in the district as well as in the neighbouring borough of Hull.

General Sanitary Circumstances of the District.—I propose, in the first place, to give a summary of the general sanitary conditions observed, and secondly, to describe these somewhat in detail with regard to the several villages inspected in the district.

Dwelling Accommodation.—The cottages throughout the district are as a rule well built, and almost all have doors and windows at the back as well as at the front. Comparatively little crowding of dwellings upon area exists, except at Hessle. Generally there is inefficiency of surface drainage about dwellings, the ground surface at the back in a large proportion of cases being neither properly guttered nor paved, and in some instances the slope was found to be actually towards dwellings, thus causing dampness of foundations. In addition, a considerable number of houses are unprovided with eave spouts,



and as a result dampness of walls and basements is very general in the district.

Water Supply.—The water supply of the district is various. The inhabitants of the eastern villages obtain their supply from “syke wells” sunk in the sand and alluvium, and as these wells are frequently found in close proximity to leaky drains and privies, they are very liable to pollution. In certain parts of the western division the water mains of the Hull Corporation have been laid, but comparatively few of the inhabitants have as yet availed themselves of this source of supply, they for the most part preferring to get their water, which is often of a very doubtful quality, from private wells. Where, however, the water of this part of the district is obtained from deep bores in the Chalk, it is frequently of excellent quality.

In only one village, that of Welton, is the supply drawn from springs, and in one or two places rainwater tanks form the only source of supply. In a great many cases the domestic water supply was found to be at an unreasonable distance from the houses. The provisions of the Public Health (Water) Act of 1878 do not, with one or two exceptions, appear to have been enforced in the district. In the following Table II. are given the results of a number of analyses of water obtained from many of the sources of supply at different periods:—

TABLE II.

SHOWING ANALYSES of various WATER SUPPLIES in the SCULCOATES RURAL SANITARY DISTRICT made at different Periods by MR. JAMES BAYNES, the County Analyst for the East Riding.

Name of Village.	No. of Sample.	Source.	Date of Analysis.	Grains per Gallon.		Parts per Million.		Approximate Depth of Wells in Feet.
				Total Solids.	Chlorine.	Free Ammonia.	Albuminoid Ammonia.	
ANLABY.	1	Big pump -	14 August 1877 -	29·4	1·32	·004	·006	130
	2	Do. -	9 May 1889 -	14·4	1·95	·0214	·0104	„
	3	Little pump -	14 August 1877 -	29·2	1·3	·01	·005	„
HESSLE.	4	North Field -	7 March 1890 -	22·7	·95	·0444	·064	?
	5	East Hessle -	24 October 1889 -	32·6	8·1	·148	·048	?
	6	Hearfield's Terrace -	24 October 1889 -	33·4	1·4	·001	·008	50
	7	Do. -	29 January 1890 -	26·5	1·4	·0532	·0272	„
	8	Chapel Yard -	2 October 1889 -	29·0	1·45	·0214	·016	„
NORTH FERRIBY.	9	Narrow Lane pump	14 March 1882 -	58·0	5·2	·053	·05	90
	10	Do. -	5 September 1889 -	48·9	2·8	·032	·046	„
	11	Do. -	15 October 1889 -	54·2	3·2	·0586	·176	„
	12	Low Street pump -	5 September 1889 -	42·0	4·5	·0346	·024	60
	13	Do. -	15 October 1889 -	48·6	6·6	·0066	·03	„
	14	New upper pump -	3 February 1890 -	76·0	4·3	·240	·142	95
	15	Do. -	25 March 1890 -	68·5	4·1	·054	·084	„
	16	New lower pump -	14 January 1890 -	50·1	3·1	·0906	·318	53
	17	Do. -	25 March 1890 -	58·4	4·2	Nil.	·024	„
KIRK ELLA.	18	Public pump -	27 September 1877 -	26·0	1·15	·02	·07	135
	19	Do. -	3 August 1882 -	20·3	1·2	·026	·01	„
WEST ELLA.	20	Public pump -	7 March 1890 -	22·5	1·9	·04	·0434	305
WELTON.	21	Petty's Farm -	21 February 1880 -	49·0	2·73	·06	·11	?
WILLERBY.	22	Wallis' Farm -	14 August 1877 -	26·0	1·1	·0026	·002	140
Hull Waterworks	23	Springhead -	4 March 1890 -	22·0	1·25	·0266	·028	—
SUTTON.	24	Private well -	15 January 1883 -	50·0	9·0	·08	·062	?
	25	Well at Police Statn. -	20 December 1884 -	69·5	9·5	·052	·08	?
	26	Rutlaud Terrace -	18 September 1889 -	90·0	9·4	·032	·1072	23

From this Table the very variable quality of the supplies will be seen, and to some of the particular analyses I shall have to refer later in the report. The

analyses Nos. 1 to 22 inclusive are of water from wells sunk into the Chalk, and for purposes of comparison I have given in No. 23, an analysis of the Hull water, obtained from the same source. The superior chemical purity of the Hull water is very noticeable. The analyses Nos. 24-26 inclusive are of waters obtained from "sype" wells sunk in the sand and drift at Sutton.

Sewerage.—In most of the villages, lengths of drain pipes have been laid down here and there, and in nearly all cases these discharge into one or other of the dykes or land drain ditches to which I have already referred. In no case is the sewage submitted to any form of treatment, and none of the sewers are provided with means for inspection, whilst arrangements for ventilation and flushing are frequently absent, or where present, are altogether inadequate.

The house drains throughout the district are very defective, being constructed frequently of rubble or of agricultural pipes, and often containing in their course numerous unnecessary catchpits. The ground along the course of such drains is necessarily permeated by filth. Hitherto apparently no supervision of any kind has been exercised over the connexion of the house drains with the sewers, and as a consequence these communications have been irregularly made. The drainage from mansions is, as a rule, discharged into cesspits, excavated to a depth of some 20 to 60 feet. Generally speaking, no attempt has, I understand, been made to render them watertight, and as a result the sewage soaks into the surrounding soil, or where the cesspool is sunk to the Chalk, finds its way into the water-bearing stratum, to become perhaps a grave source of danger. The danger is intensified in those cases, of which I understand there are several, where a boring has been made into the Chalk for the express purpose of getting rid of the sewage amongst its fissures. I was furnished with a list of some 20 of these cesspools which were stated to be in existence in the district. Cesspools of this sort are not only a danger to particular local water supplies, but some of them appeared to me to be so situated as perhaps to compromise certain of the sources of the Hull water supply.

Excrement and Refuse Disposal.—The privies are almost all constructed on the Hull system, having each a small fixed receptacle under the seat. These receptacles are not, as a rule, cemented or otherwise rendered watertight, and consequently allow of the percolation of liquid on to, and into, the soil. In a few instances pails have been provided. The larger houses are furnished with indoor waterclosets, which are mostly in direct communication with unventilated cesspits or sewers. The soil-pipes are frequently unventilated or are furnished with a pipe one or two inches in diameter, which is carried to the roof. In only one instance did I see a soil-pipe properly ventilated by means of two openings on the house drainage. In most of the villages the removal of refuse is carried out by contractors employed by the Sanitary Authority. This work is ostensibly done at weekly intervals, but I found that in practice it was rarely carried out oftener than once a fortnight, whilst in some places even a longer interval was allowed to elapse. A few overflowing filth receptacles were noticed, but on the whole nuisances due to filth accumulation were conspicuously absent throughout the district.

In support of the above general statements I now propose to give a somewhat detailed account of the sanitary circumstances of the constituent villages, taking the eastern villages first.

(a.) Eastern, or Holderness, villages:—

Preston (population, 1881, 881).—The village is situated north and south on a sand ridge, slightly elevated above the plain of Holderness. Several of the houses are damp from want of proper eave spouting, and the yards at the back are in many instances badly paved and sloppy. A block of cottages situated in Church Lane has been recently renovated, and supplied with good paved yards. The water supply is obtained from private "sype" wells sunk in the sand to a depth of some 30 feet. These wells are frequently, from their situation, liable to surface pollution, and in one instance a cesspit full of offensive sewage was noticed within six yards of one of the wells. In Church Lane there are one or two houses totally unprovided with drinking water. The houses on the west side of the village all drain into an open land drain which is cleaned out annually by the Rural Sanitary Authority. For the houses on the east side a length of pipe drain has been laid which

intercepts the sewage and conveys it into the open land drain already referred to. Preston is not scavenged by the Sanitary Authority, but the night-soil is disposed of by the tenants on their gardens, and the middens are, in general, kept fairly well cleaned out. In the case of a public-house the privy was found to discharge into a pigstye. In a house provided with an indoor watercloset the soil-pipe was directly connected with the public drain, and had a lead pipe only one inch in diameter carried up to the roof as a ventilator.

At Preston West End, a small cluster of houses, the water supply is obtained from a public well situated at the roadside. In a low-lying part of the township known as Salt End, an estate has recently been laid out, and some three miles of roadway have been made and sewered by means of 12-inch sanitary pipes, having an outfall into the Preston Land Drain. The water supply for the houses erected on this estate is brackish, and unfit for drinking purposes. It is obtained from shallow bores sunk in the warp and drift, and probably consists mainly of Humber water. The Sanitary Authority have recently taken action under the Public Health (Water) Act of 1878 to enforce the provision of a wholesome supply of water to these houses, and I understand that negotiations are now in progress for the extension of the Hull water mains to this place.

Sutton (population, 1881, 1,280).—The village, like Preston, stands on a ridge slightly elevated above the Holderness plain. It consists of one long street, with a few offshoots. An outbreak of enteric fever, to which further reference will be made, occurred in this village in the autumn of last year. The houses, as a rule, appear to be well constructed, and several dwellings of the suburban-villa class have been erected during recent years. The water supply is for the most part obtained from “sand syke” wells, 20 to 24 feet deep; some of the larger houses, however, have deep borings down to the chalk. The syke wells are frequently in close proximity to drains and cesspits, and are liable to dangerous pollution. From the analyses of certain of the Sutton wells given in Table II., it will be seen that such pollution has occurred in the past, and in the cases given it had been associated with the occurrence of enteric fever. The drainage of Sutton has been carried out in a piecemeal fashion at different periods, without any regard to a regular system. The following description is taken from a report recently made by Mr. Wellstead, the Surveyor of the Rural Sanitary Authority: “The drainage of the portion of
“ the village east and west of the North-Eastern Railway, extending on one
“ side up to the Wavne Road and the Stoneferry Road, and on the other
“ through the village up to Mr. D. Brown’s property, is carried by means of
“ pipes, and has its outfall into the open ditch east of the railway, about 400
“ yards north of the main street. The ditch remains filled with sewage matter,
“ and gives off an offensive smell. Beyond this on the east, one field distant,
“ is another outfall into an open ditch for the sewage of a block of property
“ at the east end of the village. The outfall is about 300 yards from the
“ dwelling-houses, and the open ditch is full of sewage matter, and is foul
“ and offensive. The sewage matter finds its way for about 100 yards in the
“ ditch, when it soaks into the subsoil, the ditch beyond this point being
“ quite dry. The drain at the east end of the village has its outfall into the
“ Lambwith Drain, the sewage matter is held up at a point near the Ings
“ Bridge, and is very offensive.”

None of the drains are provided with any means for inspection, ventilation, or flushing. Some of the houses are in direct communication with these faulty drains by means of slop-stone pipes and watercloset soil pipes. Rain-water fall pipes generally discharge directly into the sewers. I understand that the house drains are constructed in some cases of loose rubble, and in others of pipes.

The question of a complete sewerage scheme for this village is at present under the consideration of the Sanitary Authority. Sutton is scavenged by contractors under the Sanitary Authority, and the receptacles are stated to be emptied at fortnightly intervals.

(b.) Western, or Wold, villages:—

Anlaby (population, 1881, 629).—A low-lying village, the houses of which have ample open space around them; some of the houses, however, are damp from want of eave spouts. The water mains of the Hull Corporation are laid

on to this village, and a certain number of the inhabitants obtain their supply from that source. There are, in addition, two public pumps in connexion with deep wells, and known as "big pump" and "little pump" respectively. Analyses of these wells are given in Table II., from which it will be seen that, chemically, the water at the time of analysis was apparently fairly free from organic pollution. These wells, prior to the deep borings made in connexion with the Hull Waterworks at Springhead, were comparatively shallow, but in consequence of the pumping carried on at the waterworks, the ground water level was lowered to such a degree that it was found necessary to sink them to a further depth of 100 feet. Some of the houses which obtain their supply from these wells are situated at an unreasonable distance from them. Anlaby has some pipe and brick drains, which discharge by two outfalls close to the roadside into the Sandbeck, an open watercourse. There are very few indoor drains in the village. One slop-stone was noticed in a milkshop, directly connected with a drain.

Hessle (population, 1881, 2,557).—This is the largest and most important village in the district, and contains numerous suburban residences inhabited by persons in business at Hull. Hessle is situated at a low level, and the old village forms a fairly compact cluster of houses situated around the church, with offshoots to the south (Southgate), east (East Hessle and Springfield), and north (Northfield). Enteric fever was prevalent in some terraces off Swinegate, and in Chapel Yard, in the autumn of last year. A number of houses in the village proper are old and dilapidated, whilst many are damp from want of proper surface drainage and eave spouts. The yard space to some of the houses is very deficient, and the yards are in many instances unpaved and sloppy. A block of wretched back-to-back houses in Union Place, Southgate, situated in a filthy, sloppy yard, and unfurnished with any means of water supply, are, in their present condition, quite unfit for habitation. In the case of recently erected houses, no supervision appears hitherto to have been exercised to ensure compliance with the building byelaws of the Sanitary Authority. At Springfield the back yards of comparatively new houses were found to be filled up with outbuildings of all kinds. The back premises of Hearfield's property at East Hessle were in an exceptionally filthy condition. The water mains of the Hull Corporation are laid to Hessle, but a considerable section of the inhabitants obtain their supply from one or other of the four public pumps, or from private wells. The wells in Hessle proper are, I understand, in all cases deep bores into the Chalk, but from the analyses given in Table II. (Nos. 4–8), it would appear that they are of varying purity. This is particularly noticeable in the analyses of the water obtained from the pump at Hearfield's Terrace, where enteric fever was prevalent in the autumn. The first analysis was made in October 1889, at a time when the fever was actually prevalent. The second, which was made in January 1890, was handed to me officially by the churchwardens of the parish at the time of my visit, in order to show me the extraordinary purity of the water, yet this second analysis shows a considerably higher degree of organic impurity than the former, and the water must be classed as unsafe. The drainage of Hessle proper consists of a patchwork of pipes and old brick sewers, unprovided with any means for inspection, ventilation, or flushing. Two of the brick-main sewers situated in Eastgate and Swinegate respectively were opened at the time of my visit, and whilst in the first named the sewage was found to be running freely with little appreciable deposit, there was in the latter a deposit of at least seven inches of foul black sludge. In Chapel Yard a branch drain 12 inches in diameter has recently been constructed, where a 6-inch drain would have been ample for all purposes. Some houses opposite the church discharge their sewage into a brick sewer, which in its turn discharges into an open ditch situated in the rear of dwelling-houses, which ditch at the time of my visit was full of stinking sewage. There are four main outfalls by which the sewage of the village proper is discharged into land-drains. At Springfield, where a number of houses have been recently built, the drainage is conveyed into an adjoining ditch. At Northfield, where there are two terraces containing between 20 and 30 houses, the sewage is conveyed to an open cesspool a short distance from the houses. This cesspool at the time of my visit was full to overflowing with semi-liquid filth. The drainage from East Hessle is discharged into an open land-drain, which passes along

the side of the high road from Hull to Hessle. Many of the house drains are in an eminently unsatisfactory condition. In Southgate some brick drains pass under houses, and the provision of unnecessary catch-pits and cesspools in connexion with the faulty drains undoubtedly leads to saturation of the soil with filth. At Hearfield's Terrace, where, as already stated, enteric fever has recently been prevalent, a leaky cesspit was found within a couple of yards of the bore of the well. In the better-class houses, provided with waterclosets, the soil-pipes are very insufficiently ventilated, the only precaution taken to prevent the bad air from passing from the soil-pipes into the houses being limited to the construction of a vertical shaft two or three inches in diameter, which is carried from the upper part of the soil-pipe to a point above the roof of the house, such pipes having in them several angles.

Hessle is scavenged under contract, and the work is apparently fairly well carried out, although there were some complaints of irregularity in the visits of the scavenger.

Kirk Ella (population, 1881, 329) is situated on the south-east slope of the Chalk wolds. The village contains a number of better-class houses. The water supply is obtained partly from the mains of the Hull Corporation, and partly from a well 135 feet in depth, of which 100 feet is sunk, and 35 feet bored. This well is situated close to the churchyard, but from the two analyses given in Table II. the water when analysed was apparently very similar in quality to that of the Hull Corporation. This village has been recently (1889) drained by means of pipe sewers, with an outfall into a land drain. Two or three 4-inch ventilating pipes have been fixed to trees in connexion with the system, but, as usual in the district, no means of drain inspection have been provided. The scavenging is apparently well carried out under contract.

Melton (population, 1881, 172).—A small hamlet situated at the foot of the southern slope of the Chalk wolds. Several cottages were noticed which were very damp from want of eave spouts. There is a row of cottages, which from dampness, dilapidation, want of surface drainage, and want of proper privy accommodation, are quite unfit for habitation. The water supply here is obtained from private wells.

North Ferriby (population, 1881, 473) is situated about half a mile from the Humber, on the south slope of the Chalk wolds, and contains a number of better-class houses. In this village enteric fever was prevalent in the autumn of 1889, and to this outbreak I shall refer later. Up to the time of the appearance of the fever the poorer inhabitants had to rely for their water supply chiefly upon two pump-wells, known respectively as the "Narrow Lane" and "Low Street" pumps. After analysis, however, of the water, the Narrow Lane pump was closed, and two new wells were sunk in the upper and lower parts of Narrow Lane respectively. Of these the lower one only affords a supply of usable water, and this is situated at an unreasonable distance from many of the houses. The analyses of these various wells are given in Table II., Nos. 9 to 17. The larger houses are supplied from deep wells bored into the Chalk. North Ferriby has been drained throughout by means of sewers, partly constructed of brick and partly of pipes, which have an outfall into the Humber. In connexion with this system two or three ventilating pipes were erected last year, but there is no regular plan for either the ventilation or inspection of the sewers. One of the brick sewers which was opened for my inspection, and which was situated near to where the outbreak of enteric fever occurred, contained a deposit of black stinking sludge, 7 or 8 inches in depth. The arrangements for house drainage here are very defective, and even in the case of better-class houses, the house drains are frequently constructed of agricultural pipes. The scavenging is carried out under contract.

Swanland (population, 1881, 438).—A long straggling village situated on the Chalk wolds and having an elevation of over 200 feet above Ordnance datum. The houses are mostly well built, and have ample space around them. Some were observed to be very damp in consequence of a want of proper eave spouting, and some of the yards were sloppy owing to absence of proper paving and surface drainage. The chief water supply is obtained from a public well 76 yards deep, situated close to a large pond at the top of the village, and furnished with compound machinery to wind up the buckets,

and a friction brake to stop the windlass from running away. From its depth it is a matter of considerable labour to obtain the water. At the lower or eastern end of the village the inhabitants are badly supplied with water, being there chiefly dependent on rain water. A pipe-drain, as usual in this district unprovided with any means for inspection or for ventilation, has been constructed to take the sewage of the village. This is conveyed into the neighbouring parish of West Ella, where the liquid matter is said to escape by means of a fissure into the Chalk water-bearing stratum. The scavenging of Swanland is carried out by the occupiers in a fairly satisfactory manner.

Wauldby (population, 1881, 44).—A small cluster of houses situated high up on the Chalk wolds (elevation over 300 feet), comprising a farmhouse with labourers' cottages. The cottages are damp, have defective yards, and are unprovided with surface drainage; the water supply is rain water.

Welton (population, 1881, 669) is a picturesque village, situated at the foot of Welton Dale. The dwellings are well built, mostly with ample space around them, and the yards and passages are better paved and provided with better surface drainage than any other village in the district. The water supply is obtained from two sources: (a) a copious spring rising in the Chalk, the water from which is piped to some of the houses, and to a public spout at the north end of the village, and (b) a fountain in the middle of the village green supplied with water collected from the hills above. In some cases the sources of the supply are at unreasonable distances from the houses. The village has been drained throughout by means of pipe sewers, to which, however, no special means of ventilation or inspection have been provided. The rain-water fall pipes are, almost invariably, connected directly with the sewers, and in many instances these pipes are in dangerous proximity to bedroom windows. Special means for flushing the sewers have been provided. The scavenging is carried out by a contractor, nominally at weekly intervals; but as a matter of fact I found that this interval had been considerably exceeded, and that some of the receptacles were in consequence full to overflowing.

West Ella (population, 1881, 136).—A small hamlet situated on the Chalk wolds between Swanland and Kirk Ella. It consists chiefly of cottages built in the modern Gothic style, well detached, with gardens around them. The water supply is obtained from a well 305 feet deep, situated close to a large pond at the lower end of the village. The water is stated to be of good quality, and from the analysis given in Table II., No. 20, it would appear that this statement is justified. This well is at a considerable distance from some of the cottages. The house slops are carried in drains of imperfect construction, and are discharged either into a land-drain or into the pond above noticed. At the back of a cottage where a death from enteric fever occurred during last autumn, there was a deep filthy cesspit close to the back door, and a few yards further on was a second cesspit, some five yards from the door of the next house. It is said that these cesspits had not been cleaned out for several years, and the waste pipes from the indoor slop stones, which were provided with bell-traps only, discharged directly into them.

Willerby (population, 1881, 312).—A compact village to the north of Kirk Ella. Several houses damp from want of eave spouts were noticed, and some dilapidated cottages, many with badly paved and sloppy yards. This village has been drained by pipes, having no means for ventilation or inspection, with their outfall into the Sandbeck. The water supply is obtained partly from the Hull Waterworks and partly from a well 140 feet deep. Scavenging is carried out by contract.

Slaughter-houses.—There are 11 slaughter-houses in the District, regulated under byelaws allowed in 1878, which are inspected from time to time by the Medical Officer of Health and the Inspector of Nuisances. All appeared to be clean and well kept. In one or two instances the flooring was defective, and in none did I find that the regulations with regard to the removal of garbage, &c., were complied with.

A considerable number of pigs are kept in the district, and in some cases the sties are situated too near to dwellings.

There are said to be no *common lodging-houses* in the district.

Cowsheds, Dairies, and Milk-Shops.—135 cowsheds and dairies, containing 713 cows, have been registered in the district, and regulations have been drawn up by the Sanitary Authority with respect to them. These regulations came into force on November 4th, 1889, but at the time of my inspection they had apparently not been carried out, as several of the cowsheds that I saw were overcrowded, and nearly all required lime-washing.

Means for isolation of Infectious Diseases, &c.—The Rural Sanitary Authority possess no means for the isolation of persons suffering from infectious disease, and as a result such disease, as for instance enteric fever, rarely remains limited to the person first affected in the household. The necessity for hospital provision has been pointed out from time to time by the Medical Officer of Health, and also by the Local Government Board after each of the two previous inspections of the district already referred to. A few cases have been sent to the Hull Sanatorium, but it has not been found practicable to make any permanent arrangement with the Hull Corporation for the treatment of persons from the Rural District suffering from infectious disease. Infected dwellings are disinfected by fumigation, the Medical Officer of Health keeping in stock for this purpose “iron cases filled with a mixture of sulphur, nitre, and charcoal (‘Sculcoates septicide’),” which mixture upon ignition burns out in the iron case. The Sanitary Authority, however, possess no means for the efficient disinfection of clothing and bedding, their only method at present of dealing with these articles being to destroy them.

The Sanitary Authority in December 1889 adopted the Infectious Disease (Notification) Act, 1889, and the provisions of this Act came into force in the district on January 9th of the present year.

General Sanitary Administration.—In addition to the powers possessed by Rural Sanitary Authorities under the Public Health Acts, the Authority obtained by Order of the Board, issued February 1876, powers as follows: Under section 45 of the Public Health Act, 1875, powers for regulating deposit of refuse within the contributory places of Hessle, Preston, Welton, Sutton, Kirk Ella, North Ferriby, and Swanland; and under sections 112–115 and 157–158 powers for regulating offensive trades and new streets and buildings within the contributory places of Hessle and Sutton. By another Order of the Board, issued October 1885, the Sanitary Authority’s powers under sections 157–158 were extended to all the contributory places in the district; and further powers were at the same time conferred as follows: Under sections 155–156, powers for regulating line of buildings in streets within the contributory places of Anlaby, Hessle, Kirk Ella, North Ferriby, Preston, Sutton, Swanland, Welton, and Willerby; under section 160 powers as regards naming of streets and numbering of houses and for dealing with ruinous and dangerous buildings within the whole district, and under section 170, and the second and third paragraphs of section 169, powers for regulating slaughter-houses within the contributory places of Hessle, Kirk Ella, Preston, Sutton, and Willerby.

Under the first-named Order the Authority drew up a code of byelaws with respect to new streets and buildings, which were allowed by the Board on July 23rd, 1878. At the same time byelaws with respect to scavenging and to the regulation of common lodging-houses and of slaughter-houses were also allowed. These were followed by additional byelaws as regards new streets and buildings, which were allowed August 25th, 1879.

No byelaws have been yet prepared under the Order issued in 1885. The existing byelaws as to new streets and buildings are fairly good, so far as they go, but they are defective as regards certain important matters: as for example, they do not provide for space in front of houses, or for the removal of filth from building sites, whilst their provisions with regard to the construction and ventilation of drains and to the construction of privies, ashpits, and the like, are very far from being sufficiently definite.

Notwithstanding the various powers possessed by this Authority, it will have been seen from what has been said in the foregoing portion of this report, which treats of the sanitary circumstances of the district, that, with the exception of the organization of a system of excrement and refuse removal, there has been apparently but little well-considered action by the Authority

to ensure the permanent improvement of their district. Some of the village drains have undoubtedly been reconstructed, and some improvement has here and there been effected in the water supply and privy accommodation, but the work done has often been of an unsatisfactory and makeshift character. Taking the example of the sewerage only, it is found that sewers relaid and extended have been in some cases connected with old rubble or agricultural pipe drains; that no means have been provided for the efficient ventilation, flushing, or inspection of the sewers; that no precautions have been taken to ensure that the house drains connected with the sewers have been themselves properly constructed, or that the connexions of the drains and sewers have been efficiently made; and that nowhere has there been any attempt made so to deal with sewage as to prevent its fouling water-courses.

Many of the deficiencies in the sanitary circumstances of the district have been brought year after year to the notice of the Sanitary Authority by the Medical Officer of Health, and, in addition, some of the more serious of these defects have been officially pointed out by the Local Government Board along with recommendations for their amendment after inquiries held by Dr. Blaxall and Dr. Airy in 1877 and 1882 respectively. A copy of these recommendations will be found in the Appendix, and I may note with regard to them that, with the exception of recommendations (2), (4), and (7) appended to Dr. Blaxall's report, and No. (1) of those appended to Dr. Airy's, little has been done in the directions indicated by the Board.

Prior to my inspection a memorial was received by the Board asking for inquiry into the condition of North Ferriby, and at the time of my visit to Hessle the churchwardens of that parish waited upon me on behalf of the vestry to make a formal protest against the inaction of the Sanitary Authority.

During the last year the Authority have appeared to be more alive to the duties devolving upon them, and schemes for the sewerage of Sutton and Hessle have been drawn up and submitted to the Local Government Board, and Mr. W. Wellstead, C.E., has recently been appointed *Surveyor* for the Rural Sanitary District, at a salary of 120*l.* a year. During my inspection several of the members of the Sanitary Authority took considerable interest in its progress, and the chairman accompanied me to almost every village. It is to be hoped that in the future much good work, still in abeyance, for the permanent improvement of the public health of the district will be carried out.

Mr. Thomas Walton, M.R.C.S., F.C.S., of Hull, has held the appointment of *Medical Officer of Health* since the Sanitary Authority was constituted. He receives a salary of 65*l.* per annum, half of which has hitherto been paid out of the Parliamentary Grant. Mr. Walton has made himself thoroughly acquainted with the sanitary needs of his district, and has from time to time brought them to the notice of the Authority. He takes very great interest in his work, and has given sound advice, much, however, of which has hitherto been unheeded, or attended to in a makeshift fashion only.

Mr. Richard Attenboro, of Hessle, acts as *Inspector of Nuisances*, at a salary of 50*l.* a year. He is also School Attendance Officer for the district, and is expected to devote his whole time to the duties of the two offices. He has a fair knowledge of the district, and appears to be active in the suppression of common nuisances, but hitherto he has been apparently somewhat at a loss in dealing with nuisances requiring structural remedy.

Mortality Statistics and prevalence of Disease.—In Table III. the mortality statistics for the Sculcoates Rural Sanitary District for the 16 years 1874-89 are given. No allowance has been made for the deaths in the Union Workhouse, which is situated within the Borough of Hull, of persons belonging to the district, and the death-rates given in this Table are, in consequence, somewhat understated.

TABLE III.

MORTALITY STATISTICS of the SCULCOATES RURAL SANITARY DISTRICT for the 16 years 1874-89.

Year.	Births registered.	Deaths from all Causes.	Deaths from									Deaths from Diseases in Cols. 4-12.	Deaths from Phthisis.	Deaths from Pneumonia, Bronchitis, and Pleurisy.	Deaths from Heart Disease.	Deaths of Infants under one year of age.	
			Small-pox.	Measles.	Scarlatina.	Diphtheria.	Whooping Cough.	"Fever."			Diarrhoea and Dysentery.						
								Typhus.	Enteric.	Other or Doubtful.							
1.	2.	3.	4.	5.	6.	7.	8.	9.	10.	11.	12.	13.	14.	15.	16.	17.	
1874	-	212	123	—	—	2	3	1	—	5	—	3	14	11	11	7	35
1875	-	223	131	—	—	10	4	—	—	5	—	6	25	8	13	6	35
1876	-	270	121	—	—	—	—	1	—	2	3	5	11	15	8	7	33
1877	-	262	154	—	—	—	27	8	—	5	5	4	49	10	12	9	38
1878	-	258	136	—	2	3	3	2	4	2	—	7	23	9	11	6	36
1879	-	263	156	—	2	9	1	4	—	1	—	1	18	11	14	7	26
1880	-	277	128	—	2	1	1	—	—	3	—	9	16	6	15	6	37
1881	-	247	151	—	1	12	1	1	—	1	2	5	23	7	8	11	34
1882	-	273	157	—	2	21	—	—	—	1	—	8	32	16	15	14	32
1883	-	236	130	—	—	1	1	2	—	—	—	4	8	11	23	11	32
1884	-	232	150	—	—	2	1	5	—	1	—	3	12	16	17	7	35
1885	-	256	128	—	—	1	1	1	—	3	—	6	12	7	17	7	24
1886	-	238	132	—	—	—	—	—	—	1	—	9	19	12	13	12	27
1887	-	262	111	—	2	1	—	1	—	—	—	5	9	8	8	12	36
1888	-	184	128	—	—	1	1	1	—	3	1	1	8	7	17	7	32
1889	-	234	128	—	1	2	1	3	—	9	—	3	19	14	14	8	31
Sculcoates Rural Sanitary District. 16 years, 1874-89		29.2	16.1	.00	.09	.49	.33	.22	.42			.59	2.15	1.25	1.61	1.02	13.3
England and Wales		33.0	19.8	.06	.41	.52	.14	.47	.32			.76	2.71	—	—	—	14.3
Registrar-General's Standard Districts		28.9	13.6	.01	.23	.16	.18	.32	.10			.37	1.33	—	—	—	10.1
Rates per 1,000 of the population per annum in each instance.																	Per 100 births.

It will be seen from the Table that in the Sculcoates Rural Sanitary District, although the general death and infant mortality rates have been below those for England and Wales, they have been considerably higher than the rates which obtained in the healthiest rural districts. Of the several so-called zymotic diseases, it will be observed that there has been no death registered from small-pox during the 16 years; that the mortality from measles and from whooping cough has been below that of Standard Healthy Districts; that the rates from scarlatina and from diarrhoea have been below those for England and Wales, but considerably in excess of those in the Registrar-General's Standard Districts, and that the death-rates from diphtheria, and from "fever" have been much higher than the rates for the kingdom at large. Indeed as compared with the Standard Healthy Districts, the diphtheria and fever death rates of Sculcoates show ratios respectively of 183 and 420 to 100.

As already stated, the exceptional prevalences of diphtheria in 1877 and of scarlatina in 1881-82 were the subjects of special inquiry by Dr. Blaxall and Dr. Airy respectively. During the inquiry to which this report refers my attention was specially directed to an exceptional prevalence of enteric fever which occurred in the latter half of 1889, and which affected the villages of Sutton, North Ferriby, West Ella, and Hessle. The total cases were 80 in number, and of these 8 proved fatal. In Table IV. will be found as complete a list of the cases in each village as I could obtain, with the approximate date of attack of each. The localities of these cases were as follows:—Sutton, 30 cases, 1 death; Hessle, 25 cases, 2 deaths; North Ferriby, 16 cases, 3 deaths; West Ella, 6 cases, 2 deaths.

TABLE IV.

LIST of CASES of ENTERIC FEVER reported to have occurred in the Villages of (a.) SUTTON, (b.) HESSLE, (c.) NORTH FERRIBY, and (d.) WEST ELLA during the Second Half of the Year 1889, with approximate Date of Attack in each Case.

(a.) SUTTON.					
Approximate Date of Attack.	Residence.	Initials of Patient.	Sex.	Age.	Remarks.
1889.					
July 7 -	3, Albert Terrace -	S. S.	F.	7	
August 1 -	7, Albert Terrace -	H. C.	M.	26	
August 9 -	3, Rutland Terrace -	A. D.	F.	46	
August 24 -	8, Albert Terrace -	R. L.	F.	12	
August 24 -	8, Albert Terrace -	L. L.	F.	10	
August 24 -	8, Albert Terrace -	J. L.	M.	6	
August 24 -	4, Rutland Terrace -	A. G.	F.	30	
August 24 -	4, Rutland Terrace -	A. G.	F.	6	
August 26 -	3, Rutland Terrace -	L. D.	F.	9	
August 27 -	2, Albert Terrace -	K. P.	F.	10	
August 28 -	6, Albert Terrace -	A. S.	F.	12	
August 30 -	3, Rutland Terrace -	F. D.	M.	12	
August 30 -	7, Albert Terrace -	E. C.	F.	23	
August 30 -	3, Albert Terrace -	W. S.	M.	12	
August 31 -	4, Rutland Terrace -	T. G.	M.	8	
August 31 -	4, Rutland Terrace -	W. G.	M.	9	
August 31 -	4, Rutland Terrace -	A. G.	F.	5	
September 5 -	6, Albert Terrace -	G. S.	M.	15	
September 5 -	Stoneferry Road -	J. A.	M.	12	
September 7 -	4, Rutland Terrace -	E. G.	F.	3	Died in Hull Sanatorium, September 27.
September 14 -	3, Albert Terrace -	A. S.	F.	23	
September 15 -	Stoneferry Road -	A. F.	F.	44	
September 15 -	3, Rutland Terrace -	S. D.	F.	6	
October 12 -	2, Albert Terrace -	S. P.	F.	42	
October 13 -	Bilton Road -	J. G.	F.	20	
October 15 -	Stoneferry Road -	L. F.	F.	12	
October 24 -	Stoneferry Road -	N. F.	F.	10	
October 24 -	Stoneferry Road -	A. F.	F.	8	
October 24 -	Stoneferry Road -	E. F.	F.	6	
December 1 -	4, Rutland Terrace -	W. G.	M.	40	

(b.) HESSLE.					
Approximate Date of Attack.	Residence.	Initials of Patient.	Sex.	Age.	Remarks.
1889.					
August -	Southgate -	T. J.	M.	19	
August 10 -	Chapel Yard -	M. B.	F.	34	
August 26 -	Chapel Yard -	E. P.	F.	8	
August 29 -	Chapel Yard -	W. L.	M.	9	
September 10 -	Swinegate -	V. B.	F.	4	
September 13 -	Chapel Yard -	K. P.	F.	16	Died October 3.
September 14 -	Hearfields Terrace -	W. E. B.	M.	19	
September 19 -	Chapel Yard -	S. L.	M.	29	
October 1 -	Hearfields Terrace -	M. K.	F.	16	
October 6 -	Hearfields Terrace -	A. L.	F.	12	Died October 17.
October 11 -	Hearfields Terrace -	G. K.	M.	12	
October 24 -	Hearfields Terrace -	T. L.	M.	9	
October 24 -	Hearfields Terrace -	B. L.	M.	3	
October 24 -	Swinegate -	E. B.	F.	12	
November 1 -	Chapel Yard -	R. B.	M.	40	
November 5 -	Swinegate -	L. B.	F.	37	
November 5 -	Hearfields Terrace -	A. C.	M.	13	
November 25 -	Hearfields Terrace -	W. S.	M.	30	
November 25 -	Hearfields Terrace -	E. L.	F.	4	
November 25 -	Hearfields Terrace -	S. L.	F.	12	
November 25 -	Hearfields Terrace -	E. L.	F.	16	
November 25 -	Hearfields Terrace -	J. L.	M.	19	
November 25 -	Hearfields Terrace -	C. L.	M.	2	
December 1 -	Hearfields Terrace -	E. K.	F.	35	
December 1 -	Hearfields Terrace -	F. K.	F.	9	

(c.) NORTH FERRIBY.

Approximate Date of Attack.	Residence.	Initials of Patient.	Sex.	Age.	Remarks.
1889.					
July 12 - -	Low Street - -	A. T.	F.	33	
July 20 - -	" " - -	J. T.	M.	35	
July 28 - -	" " - -	E. T.	M.	3	
August 24 - -	" " - -	T. W.	M.	34	
August 24 - -	" " - -	C. W.	M.	7	
August 26 - -	" " - -	J. P.	M.	11	Died September 16.
August 26 - -	" " - -	T. P.	M.	9	
August 27 - -	" " - -	A. W.	M.	11	
August 28 - -	" " - -	R. W.	F.	14	
August 31 - -	" " - -	G. A.	M.	18	Removed to West Ella.
September 1 - -	" " - -	G. G.	M.	3½	Died September 15.
September 1 - -	" " - -	J. R.	M.	8	
September 27 - -	" " - -	V. R.	M.	47	
October 25 - -	" " - -	E. G.	F.	24	Died November 6.
November 7 - -	" " - -	C. T.	M.	10	
November 14 - -	" " - -	P. T.	M.	8	

(d.) WEST ELLA.

Approximate Date of Attack.	Residence.	Initials of Patient.	Sex.	Age.	Remarks.
1889.					
August 31 - -	Grange Farm - -	G. A.	M.	18	Removed to West Ella from North Ferriby on or about September 5.
October 25 - -	" " - -	H. A.	M.	14	
October 25 - -	" " - -	E. A.	F.	12	Died November 28.
October 25 - -	" " - -	H. A.	M.	10	
October 25 - -	Wallis's Farm - -	L. W.	F.	21	
October 30 - -	West Ella - -	M. H.	F.	14	Died November 15.
November 12 - -	" " - -	R. H.	M.	14	Removed to Hull Sanatorium.

From the list of cases given in the Table it will be seen that in each village the fever prevalence was limited to particular localities. At Sutton chiefly to Albert and Rutland Terraces; at Hessle to Chapel Yard and Hearfields Terrace, Swinegate; at North Ferriby to Low Street; and at West Ella to Grange Farm. The several outbreaks were each made the subject of careful inquiry by Mr. Walton, the Medical Officer of Health, at the time of their occurrence, and although the subsequent inquiry which I made personally, elicited a few additional facts, it tended to corroborate the general conclusions arrived at by him. With the exception of the outbreak at Sutton which presented some features of general interest, I do not propose to deal with the prevalences in much detail.

The outbreak at *West Ella* was evidently due in the first instance to the removal there of a person from North Ferriby when suffering from enteric fever; three out of the six cases occurred in the house to which he was removed, and there is ground for believing that the remaining three cases acquired the fever from personal communication with one or other of the cases in this house.

At *North Ferriby* the fever prevalence was confined to eight households all living close to one another in Low Street. The origin of the earlier cases was obscure, but the Medical Officer of Health informed me that isolated cases of enteric fever frequently occurred in the locality in the autumn months of the year. All the affected persons obtained their water supply from a well, the water from which was stated to have been discoloured and apparently polluted

in July. Analyses made on September 5th and October 15th respectively (Table II., Nos. 10 and 11) showed the water to be of variable quality and liable to pollution, and consequently this well was closed at the end of October. The private drainage arrangements of the infected houses were unsatisfactory, but I could not ascertain any condition which was common to the inmates of the infected houses which was not shared by many neighbouring houses. One of the houses infected was that of a milk seller, and here the milk was stored in a dark cellar which was in direct communication with the street sewer by means of an untrapped sink.

In *Hessle*, out of the total 25 cases, 7 occurred in 4 households in Chapel Yard or its immediate neighbourhood, and the remaining 18 cases in 6 houses in Hearfields Terrace, Swinegate. In both these localities isolated cases of fever are reported to have occurred year after year in the autumn months. In both localities the water is obtained from bore wells, but the water from these wells was stated to be discoloured after rain, and at Hearfields Terrace (where at the time of the outbreak the drainage was in an exceedingly defective condition) a full cesspit was found close to the bore of the well. In the houses here there was no means of isolating the patients, and of the 10 households affected, in no less than six multiple cases occurred.

The outbreak in *Sutton* was, with two exceptions to be referred to hereafter, confined to two terraces situated in a cul-de-sac off the back street, and known as Albert and Rutland Terraces respectively. The following description of the locality is taken from a special report on the fever by the Medical Officer of Health: "The locality is on a decline of the western side of the glacial sand ridge upon which Sutton is built. Leaving the back street, a cul-de-sac is entered, formed by two terraces facing each other, and having open spaces at the back. Rutland Terrace is on the left, and Albert Terrace is on the right. The projecting coal-houses and privies of the houses form for each one a small backyard in which is the sink. Each yard is slightly fenced from a path three or four feet in width, which runs the length of the one terrace, turns the corner at the end, and then makes another turn to the rear of the opposite terrace, along which it passes behind the backyards of the houses to the street. Where the path crosses the end of the two terraces it is walled off from the roadway, and so forms the end of the cul-de-sac. External to the path just mentioned there are open spaces pertaining to each house, roughly fenced off from each other. Near the centre of the terraces, about 5 feet from the privies in Rutland Terrace, and a greater distance in Albert Terrace, there is a well 23 feet deep, the working pump being attached to the walls of the outhouses and approached by the path before spoken of. Each terrace had its own well and pump. It is many years since the houses were built, but before their erection the site on which they stand was a garden through which ran a ditch, part sewer and part watercourse. Before the garden was formed the ground was occupied by a farmyard. The ground in which the wells were dug is stated to have been very rotten. The two terraces are drained by 4 and 6-inch pipes, with an outfall into a street sewer at a depth of about 4 feet." At the time of the outbreak the Albert Terrace well was out of order and could not be used, and as a consequence the water supply for all the houses was obtained from the Rutland Terrace well.

The privies are all on the Hull system, the receptacle for excreta and refuse being confined to the space under the seat. These receptacles do not appear to have been rendered watertight; liquid filth was even at the time of my visit to be seen oozing out of the lower part of the privy walls in some instances. From Table IV. (a) it will be seen that prior to the last week in August three cases of enteric fever are reported to have occurred, one at No. 3, Albert Terrace (July 7th), a second at No. 7, Albert Terrace (August 1st), and a third at No. 3, Rutland Terrace (August 9th). The origin of these three cases is obscure, but Mr. Walton is inclined to believe that the second and third cases acquired their infection during the opening of a stopped drain in rear of Albert Terrace (on July 19th), which contained infected matter from the case which commenced on July 7th. The effluvium from the material removed during the cleansing of the drain is stated to have been particularly offensive.

Whatever the origin of these early cases, they were followed by a sudden outburst of fever which occurred during the last week in August, when 14 persons of seven households living in the two terraces were almost simultaneously attacked. Such an outburst suggested some common origin, such as water or milk. Upon inquiry it was ascertained that no one milk supply had been common to the infected persons; on the other hand, however, all had received their water supply from the Rutland Terrace well, the water from which upon analysis made on September 18th, showed undoubted signs of pollution (see Analysis No. 26, Table II.), and the water was forthwith condemned as unfit for use. Upon an examination of the surroundings of the well the source of pollution was traced to a leaky privy attached to No. 3, Rutland Terrace, which was situated within 8 feet of the well, and between this privy and the well a direct communication was found to exist. Into the privy had been discharged the excreta from the patient living at No. 3, who, as already stated, was attacked with enteric fever on August 9th. Before the analysis above referred to was made, the Medical Officer of Health had suspected this water, and advised the inhabitants to be careful to boil their drinking water before use. It is to be noted that although four more cases occurred in the terraces during the first half of September, two persons only were attacked later on; of these one was a woman living at No. 2, Albert Terrace (attacked October 12th), who had washed the infected linen of several of the sufferers, and the other a man (attacked December 1st) living in No. 4, Rutland Terrace, where six cases had previously occurred.

Upon making a census of the inhabitants of the terraces I found that at the time of the fever prevalence 56 persons living in 10 houses obtained their water supply from the Rutland Terrace well; that of these, 23 persons living in seven houses suffered from enteric fever; that in two of the houses in which no cases occurred it had been an habitual practice to boil the drinking water before use, whilst in the third house which escaped fever there were only two inmates, each of whom was over 60 years of age. The ages of the persons living in Rutland and Albert Terraces who received their water supply from the Rutland Terrace well, and of the persons attacked by enteric fever, are given in Table V.

TABLE V.

SHOWING INCIDENCE OF ENTERIC FEVER in ALBERT and RUTLAND TERRACES, SUTTON, amongst PERSONS at certain specified Ages who obtained their WATER SUPPLY from the RUTLAND TERRACE WELL.

Persons who used Unboiled Water for Drinking Purposes.			Persons who habitually used Boiled Water for Drinking Purposes.		
Ages.	No. of Persons Living.	No. of Persons attacked.	Ages.	No. of Persons Living.	No. of Persons attacked.
0-5	4	1	0-5	2	—
5-15	22	15	5-15	1	—
15-25	4	2	15-25	1	—
25-60	13	5	25-60	7	—
60+	2	—	60+	—	—
All ages -	45	23	All ages -	11	—

This Table shows very clearly the limitation already noticed of the fever attacks to persons using unboiled water, and it further shows the varying intensity of the fever incidence in accordance with the age, and therefore the susceptibility of the inhabitants. The figures are so small that per-centage of attacks might be misleading, still, so far as they go, the ratio attacked agrees very closely with that which has been found to obtain in previous outbreaks of enteric fever, the exciting cause of which has been the water supply.

In addition to the cases in the two terraces, persons living in two other parts of Sutton, as already stated, suffered from enteric fever; these cases, however, were closely connected with those of which details have already

been given. The additional cases were seven in number, of which six occurred in two houses situated close together in the Stoneferry Road, and a single case in a house at Bilton Road. The first case in the Stoneferry Road was that of a boy (attacked September 5th) who had been in the habit of calling at Rutland Terrace on his way to work, and who is known to have frequently drunk water from the spout of the Rutland Terrace pump. The case in Bilton Road was that of a servant girl (attacked October 13th) who frequently visited the fever-stricken families in Albert and Rutland Terraces on charitable errands from her mistress.

In concluding this report I desire to express my thanks for the courtesy shown and the assistance given to me by the members and officers of the Sanitary Authority, and by the inhabitants of the district with whom I came into contact. My thanks are especially due to the Medical Officer of Health for the cordial aid rendered to me throughout the inquiry.

FRED. W. BARRY.

May 1890.

APPENDIX.

A.—RECOMMENDATIONS attached to Report made by DR. BLAXALL in 1877.

(1.) The villages should be provided with proper sewers and house drains. (Public Health Act, 1875, sections 15 and 23.) All sewers and drains should be efficiently ventilated. Provision should be made for the disposal of the sewage in such a manner as not to be productive of nuisance, and to prevent the fouling of watercourses and ditches. Before proceeding to carry out this recommendation, it is desirable the Authority should consult a skilled engineer upon the subject of the sewerage.

(2.) The excrement removal and disposal should be effected in accordance with the principles of the "Report to the Local Government Board on certain Means of preventing Excrement Nuisances in Towns and Villages," care being taken that every house be provided with suitable privy accommodation, and strict supervision being exercised to ensure closets or privies being kept in a wholesome condition. (Public Health Act, 1875, sections 36 to 40.)

(3.) Water supplies should be protected from pollution. No imperfect drain or other contaminating circumstances should be permitted in the vicinity of the wells or other sources of water. Rain-water tanks intended for storage of water for domestic use should be properly constructed and impervious, they should be ventilated, the water should be filtered, and strict supervision should be maintained to ensure the tanks being kept in a clean and wholesome condition.

(4.) Accumulations of refuse in the vicinity of dwellings should not be allowed. Pigs or other animals should not be permitted to be kept in situations where they produce nuisances injurious to health.

(5.) The Authority should provide a place for use as a hospital for the reception of cases of dangerous infectious disease. (Public Health Act, 1875, section 131.). On this subject the Authority may usefully consult the official memorandum "On Hospital Accommodation to be provided by Local Authorities." A disinfecting chamber (section 122) and a mortuary (section 141) should be provided. Sections 120 and 121 relating to the disinfecting of dwellings and things, as also sections 126 to 129 inclusive, relating to the exposure of infected persons and things, and the letting of infected dwellings, should be enforced.

(6.) The Inspector of Nuisances should be definitely instructed as to the nature of the duties appertaining to his office, and should be required to keep a report book, also a book showing a continuous record of the sanitary condition of premises in respect of which sanitary action has been taken.

(7.) The Sanitary Authority should make such arrangements as would ensure the Medical Officer of Health receiving from the Poor Law Medical Officers immediate information on the appearance of any dangerous infectious disease, and likewise from the Registrar's returns of deaths, as recommended by the Local Government Board in their circular letter dated 23rd March 1874.

B.—RECOMMENDATIONS attached to Report made by DR. AIRY in 1882.

(1.) The Sanitary Authority should see that the lower part of Swanland village is properly supplied with water.

(2.) The Sanitary Authority should have the means of speedily isolating the earliest cases of any infectious disease in their district.

Recommendations.

I. The Authority should carry out the duties imposed upon them by the Public Health (Water) Act of 1878. They should cause periodical inspection of their district to be made to ascertain the condition of the water supply (section 7), and should, subject to the provisions of section 3, enforce a permanent supply of water sufficient in quantity and wholesome in quality to such houses in their district as have not such a supply "within a reasonable distance"; and in deciding what distance is reasonable, regard should be had to the need for the easy procuring of water in order to permit of its free use for the requirements of health and of personal and domestic cleanliness. New houses should not be allowed to be occupied until certified to be provided with sufficient water supply (section 6).

The purity of existing water supplies should be looked to, and such as are in danger of contamination should be rendered secure (as by making the upper part of the well watertight, so as to exclude surface soakage, and by removing all sources of contamination from its neighbourhood). Such as are irretrievably polluted should be closed under section 70 of the Public Health Act of 1875. The attention of the Authority should, in respect of improvement of water supply, first be drawn to the villages of Sutton, Preston, and North Ferriby.

II. No unnecessary delay should be allowed to occur in providing such parts of the district as are imperfectly sewered (*e.g.*, Hessle, Sutton, Preston) with efficient means of sewerage. The existing sewers at Kirk Ella, North Ferriby, Welton, Willerby, Anlaby, and Swanland should be provided with adequate means for their inspection, ventilation, and flushing. Provision should be made throughout the district for the disposal of sewage in such a manner as not to be productive of nuisance, and so as to prevent the fouling of watercourses and ditches. The use of cesspools for the retention of sewage should be avoided wherever possible. Where, however, their use is unavoidable, they should be placed at a sufficient distance from houses to prevent nuisance, and as far as possible from wells and underground cisterns. They should be made watertight, and should be covered in and ventilated. No overflow from cesspools should be permitted.

House-to-house inspection of the district should be systematically made, with a view to detecting defects in the house drainage, and to securing the substitution of glazed stoneware or other impervious pipes for rubble or other imperfectly constructed drains, and the disconnexion of house drains from the sewers.

It is important that the Local Authority should, under section 21 of the Public Health Act of 1875, draw up regulations in respect of the mode in which the communications between the private drains and the public sewers are to be made, and they should in all cases arrange that such connexions are made only under the superintendence of an officer of the Authority.

Rain-water fall pipes should in no case be allowed to act as sewer ventilators.

III. (*a.*) The Sanitary Authority should cause all dwellings which from dampness, want of ventilation, dilapidation, and other structural defects are unfit for habitation (*e.g.*, cottages at Melton, Union Place, Hessle, &c.) to be placed in proper repair, or permanently closed.

(*b.*) The attention of the Authority should be especially given to the danger to health arising from the dampness of foundations and walls due to the absence of proper spouting for the conveyance of rain water from the roofs of houses.

(*c.*) Yards and open spaces about houses should be properly levelled and paved, or laid with suitable materials, so as to secure efficient drainage and cleanliness.

IV. The Sanitary Authority should without delay adopt, for application throughout their district, a new series of building byelaws, based upon the model series issued by the Board, and, having adopted them, should carry

them duly into effect in such manner as to secure the dryness, proper ventilation, and general wholesomeness of all domestic buildings to be newly erected.

V. The Authority should take the necessary steps for securing due regulation of slaughter-houses and of cowsheds and dairies.

VI. The Inspector of Nuisances should be definitely instructed as to the nature of the duties appertaining to his office, and should be required to keep a report book, also a book showing a continuous record of the sanitary condition of the premises in respect of which sanitary action has been taken. He should also be directed to make a house-to-house inspection of the district, with a view to ascertaining the nuisances which call for abatement under the Public Health Act, and for this purpose the several villages should be inspected in rotation, and the record of such an inspection as above, with respect to one or other of the villages, should be presented at each monthly meeting of the Authority until the work is completed. The record should show (*a*) the houses overcrowded, (*b*) houses that from various causes are unfit for habitation, (*c*) other nuisances arising from structural defects of houses or premises, *e.g.*, from dilapidation, want of light, or ventilation, dampness, defective privy accommodation, defective drainage, absence or inadequacy of paving and channelling of yards and other open spaces.

VII. The Sanitary Authority should provide a place for the isolation and treatment of persons suffering from infectious diseases who have not proper accommodation in their own homes. Such provision need not be on a large or expensive scale, but it is essential to its usefulness that it should be kept in readiness for the reception of the earliest cases that may occur, in order that by the isolation of these, the further spread of the disease may be checked. Probably the provision of one six-bedded isolation ward block,—constructed on the lines indicated in Plan B of the Board's official memorandum,—in which two diseases in both sexes might be simultaneously treated, and situated in some central position in the Wold division of the district, would answer the requirements of the case.
